Transmission of Signals Without Generating Harmful Interference in Receiving Antennae Through Signal Transflection

10 June 2025
Simon Edwards
Research Acceleration Initiative

Introduction

In order to allow for signals to be usefully sent and received simultaneously as in cellular telephonic applications, signals emitted by cellular devices must transmit at a different frequency than that at which they receive signals from a tower. Even given this measure, the emission of large quantities of electromagnetism so near to the receiving antenna generates a certain degree of noise and limits the calibrated sensitivity of the receiving antennae.

Furthermore, transmission of signal (in the currently prevalent manner of signal transmission) requires the use of energy and these transmissions are not collimated in a single direction. Although it may be possible for collimated beams to be made to maintain a fix (the author has written about this topic at some length in prior publications (ibid.,)) on receivers in motions, a novel system of transmitting signals, at least from hand-held units, may provide a solution to a number of technical challenges including the need to reduce noise so that antenna sensitivity may be increased and the reduction of energy utilization may be achieved, as well.

Abstract

Building upon the concept of 2 June 2025 in which a material can be made to be conditionally transparent to light or reflective of light depending upon whether additional electrons are present in the material, I propose that the same principle be applied to microwave energy.

In this case, our objective; rather than being to purposefully phase-cancel light in order to determine the precise difference in amplitude between two successive waves using a sensitive photodetector; is to harness ambient electromagnetism (either from the cellular transmitter tower with which one is attempting to communicate or from other sources) so that this electromagnetism may form the basis of transmitted data sent from the hand-held units back to the tower, obviating the need to produce electromagnetism within the unit.

Provided a material capable of reflecting microwave energy (we already have a variety of metamaterials which can absorb microwaves, but a paucity of metamaterials which can reflect microwaves in a thin form-factor,) one should be able to electrify the material in order to make it conditionally transparent to or reflective of the microwaves.

In a process which may be termed *signal transflection*, the ambient EM may be conditionally reflected at a particular rate of alternation in a pulse-modulation regime which is agnostic to the frequency or amplitude of EM. This reflection of microwave energy would be sufficiently strong to make its

way to a distant receiver such a cell tower in much the same manner that light may be reflected over great distances by retro-reflective materials used to coat highway signs. By rapidly varying the property of reflectivity of the material, information may be encoded in the pulsed reflections whilst allowing all of the incoming data to be faithfully received, most likely via partial wave frequency extrapolation through voltage-magnetism convergence-divergence analysis (ibid..) In this way, even though our material would be reflecting about half of every waveform, the half which is received would provide more than enough information for the system to be able to determine the property of the overall wave.

Conclusion

Given the implementation of that signal interpretation system as well as the development of the aforementioned metamaterial, such a communications regime should be entirely feasible.

Although this system of transmission would require a somewhat thicker than usual meta-material, it should be technically possible to achieve retro-reflection of microwaves and even to conditionally redirect ambient electromagnetism in the specific direction of a tower when that direction is known.

As a consequence of the elimination of the need for a more traditional transmitter, the signal throughput would be increased, power utilization would be decreased and security may be increased as it would be possible to restrict signal direction only toward the position of trusted transmitters, preventing a malicious party from engaging in cell tower spoofing.